"Comparison of the impact resistance of honeycombs and LBM lattice structures"

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Abstract

The objective of the present project is to compare the specific impact resistance of hexagonal honeycombs panels used in aeronautical applications with body centred cubic lattice structures. The AlSi10Mg lattice structures were produced by laser beam melting and sandwiched, like the honeycomb structures, between 2024 Al sheets. Samples of both types of structures were impacted with energies ranging from 5 to 30 J. For a fixed impact deflection, the sandwiched lattice structure is able to absorb more energy than the honeycomb sandwich. For large impact energies, the cover sheet of the honeycomb presents some cracks while this is not the case for the lattice structure cover sheet. 3D X-ray tomography of an impacted honeycomb and lattices structure allows a detailed analysis of the deformation mechanisms. Furthermore, these observations allowed measuring the size of the impacted region.

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Comparison of the impact resistance of honeycombs and LBM lattice structures

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